# JOINT UTILITIES
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## Stage 3 Hosting Capacity Update

(October 1st Release)

# Engagement Group Ground Rules*

- All stakeholder engagement (Advisory Group and Engagement Group) meetings, webinars and information exchange are designed <u>solely</u> to provide an open forum or means for the expression of various points of view <u>in compliance with antitrust laws</u>.

- <u>Under no circumstances</u> shall stakeholder engagement activities be used as a means for competing companies to reach any understanding, expressed or implied, which tends to restrict competition, or in any way, to impair the ability of participating members to exercise independent business judgment regarding matters affecting competition or regulatory positions.

- Proprietary information <u>shall not be disclosed by any participant</u> during any stakeholder engagement meeting or its subgroups. In addition, no information of a secret or proprietary nature shall be made available to stakeholder engagement members.

- All proprietary information which may nonetheless be publicly disclosed by any participant during any stakeholder engagement meeting or its subgroups <u>shall be deemed to have been disclosed on a non-confidential basis</u>, without any restrictions on use by anyone, except that no valid copyright or patent right shall be deemed to have been waived by such disclosure.

- AG & EG discussions will be <u>open forums without attribution</u> and no public documents by the AG or EG will be produced unless publication is agreed upon by the group.

*Ground Rules adapted from the JU Advisory Group*

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# Background

- To drive greater consistency, the utilities all conduct their hosting capacity analysis using EPRI's DRIVE tool and present their results in the ESRI mapping environment.

- DRIVE allows each utility to calculate the hosting capacity for their distribution system using EPRI's streamlined methodology.

- Stage 2.0 of the displays was released in October 2017 with additional components added in March 2018 based on stakeholder inputs provided at the November 2017 stakeholder meeting.

- The HC Data portal includes additional elements of data based on inputs to the stakeholder process in the System Data working group.  Today we are focusing on the Hosting Capacity displays.
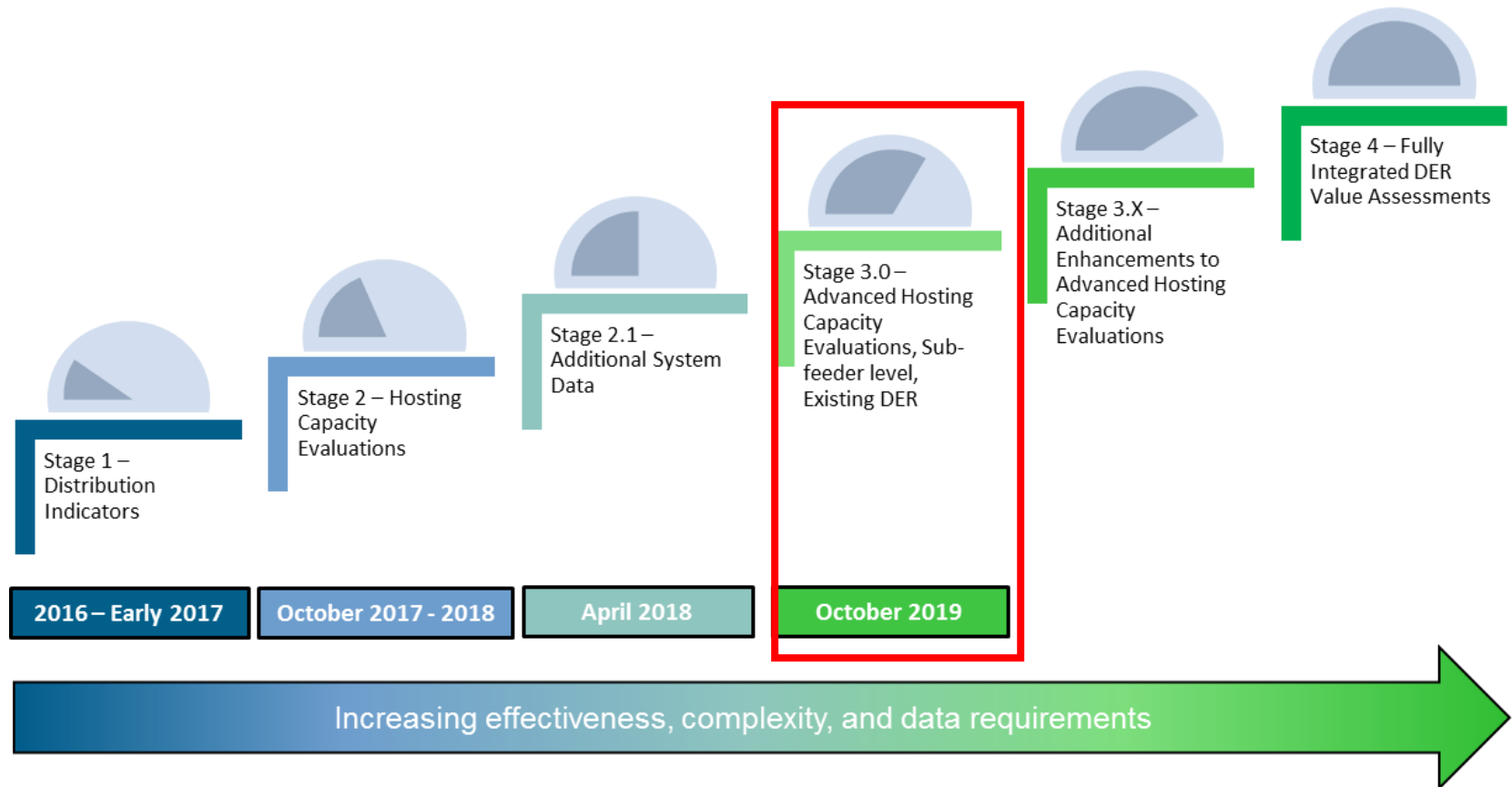
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# Hosting Capacity Implementation Roadmap



Stage 1 –
Distribution
Indicators

Stage 2 – Hosting
Capacity
Evaluations

Stage 2.1 –
Additional System
Data

Stage 3.0 –
Advanced Hosting
Capacity
Evaluations, Sub-
feeder level,
Existing DER

Stage 3.X –
Additional
Enhancements to
Advanced Hosting
Capacity
Evaluations

Stage 4 – Fully
Integrated DER
Value Assessments

| 2016 – Early 2017 | October 2017 - 2018 | April 2018 | October 2019 |
|---|---|---|---|

Increasing effectiveness, complexity, and data requirements

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# Hosting Capacity Implementation Roadmap

- The major enhancements made in Stage 3 are focused on including existing DER in the analysis and providing sub-feeder level hosting capacity.

  - Existing DER are reflected in the circuit load curves and load allocations. Stage 3 will now include solar PV and other installed DG as an explicit input into the hosting capacity analysis.

  - The hosting capacity displays will now include sub-feeder level hosting capacity. The new sub-feeder level granularity will be based on the heat mapping breakpoints and will be referred to as the "Local Hosting Capacity for PV" when line segments are selected in the displays.

  - The data pop-ups will be updated to include a "Local Hosting Capacity for PV" tab for the sub-feeder level line segments, as well as add the "DG Installed Since HCA" at the substation/bank level.

## JU Hosting Capacity Analysis Roadmap

| | Stage 2.1 release<br>April 18, 2018 | Stage 2.1 Refresh<br>October 1, 2018 | Stage 3.0 release<br>October 1, 2019 | Stage 3.X Release(s) |
|---|---|---|---|---|
| **Stage 2.1** | | | | Additional system data |
| | | | | Reflect existing DER in circuit load curves and allocations |
| **Stage 3.0** | | | | Sub-feeder level hosting capacity |
| | | | | DER included in circuit models as input to HCA |
| | | | | Large PV |
| | | | | Other DG (CHP, etc.) |
| | | | | Small PV |
| | | | | Add incremental feeder level DER installed since HCA refresh |

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# Hosting Capacity Heat Maps for Centralized PV

- Heat maps of the gross hosting capacity by feeder calculated using large centralized solar PV scenarios. Stage 3.0 will provide more location-specific sub-feeder level information by displaying the local hosting capacity across a feeder.
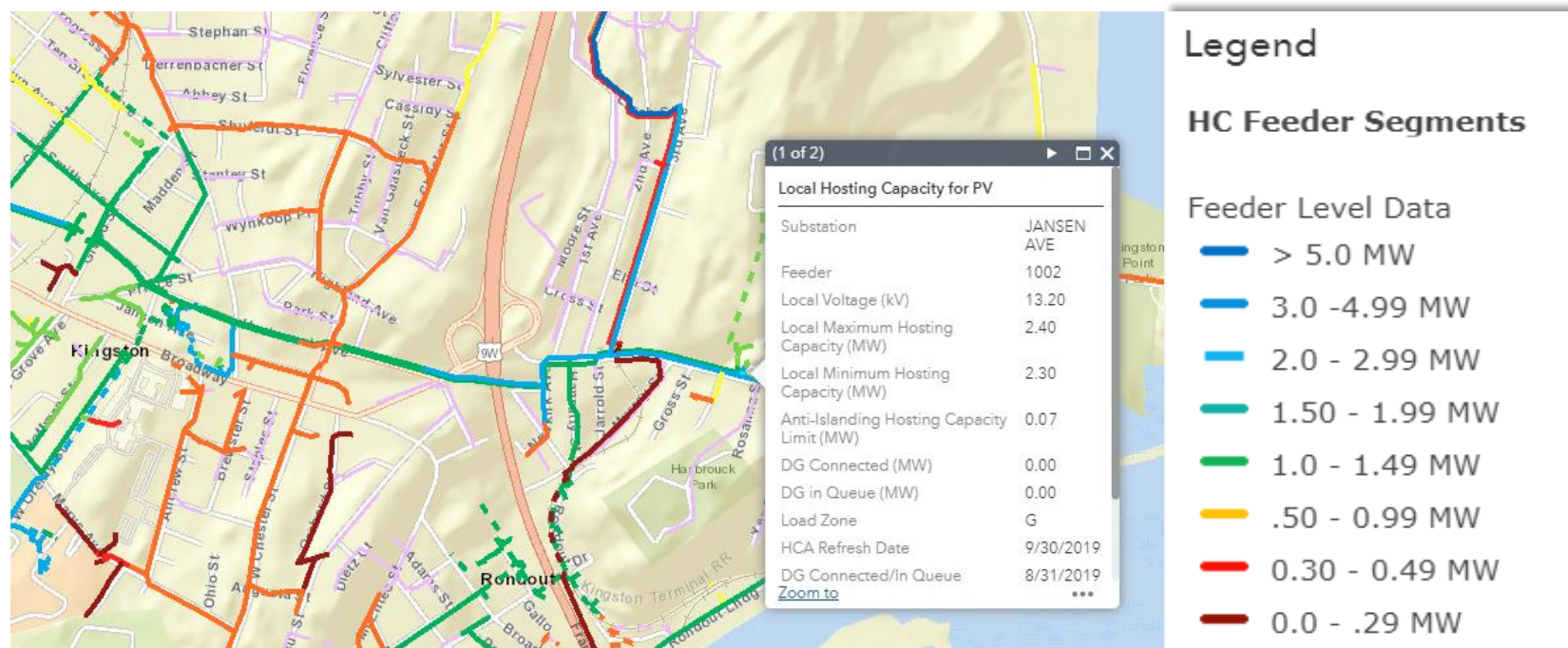


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# Stage 3 Additional Pop-up Definitions

**Local Voltage kV:** Voltage level of the selected line segment.

**Local Maximum Hosting Capacity:** Maximum Hosting Capacity value of the selected line segment.

**Local Minimum Hosting Capacity:** Minimum Hosting Capacity value of the selected line segment.

**Load Zone:**  NYISO Load zone and/or utility load zone when applicable.

**Anti-Islanding Hosting Capacity Limit (MW):** Circuit hosting capacity according to the anti-islanding hosting capacity criteria used (67% of the light load recorded at the feeder head).

**Substation Backfeed Protection:** Renamed from "Substation 3V0 Protection" to include other forms of Backfeed protection such as direct-transfer trip.

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# Stage 3 Additional Pop-up Definitions



**(1 of 2)**

**Feeder Level Data**

| | |
|---|---|
| Substation | ELSMERE |
| Master CDF | 36_30_40771 |
| Anti-Islanding Hosting Capacity Limit (MW) | 0.48 |
| Local Voltage (kV) | 4.80 |
| Local Maximum Hosting Capacity (MW) | 3.67 |
| Local Minimum Hosting Capacity (MW) | 3.05 |
| DG Connected (MW) | 0.12 |
| DG in Queue (MW) | 0.01 |
| LOAD ZONE | F-4 |
| HCA Refresh Date | September 9, 2019 |
| DG Connected/In Queue Refresh Date | September 9, 2019 |
| DG Installed Since Last HCA Refresh (MW | 0.50 |

Zoom to



**(1 of 2)**

**Substation Level Data: ELSMERE**

| | |
|---|---|
| Substation/Bank Name | ELSMERE |
| Substation/Bank Installed DG (MW) | 0.17 |
| Substation/Bank Queued DG (MW) | 0.01 |
| Substation/Bank Total DG (MW) | 0.18 |
| 2018 Substation/Bank Peak (MW) | 4.90 |
| Substation Backfeed Protection | No |
| DG Connected/In Queue Refresh Date | September 9, 2019 |
| HCA Refresh Date | September 9, 2019 |

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# Color Mapping for Hosting Capacity Analysis

- Three-phase sections of the feeders are colored from low (dark red) to high (dark blue) using the following breakpoints: <300 kW, 300-499kW, 500-999 kW, 1000-1499 kW, 1500-2000 kW, 2000-2999 kW, 3000-4999 kW, and > 5000 kW.
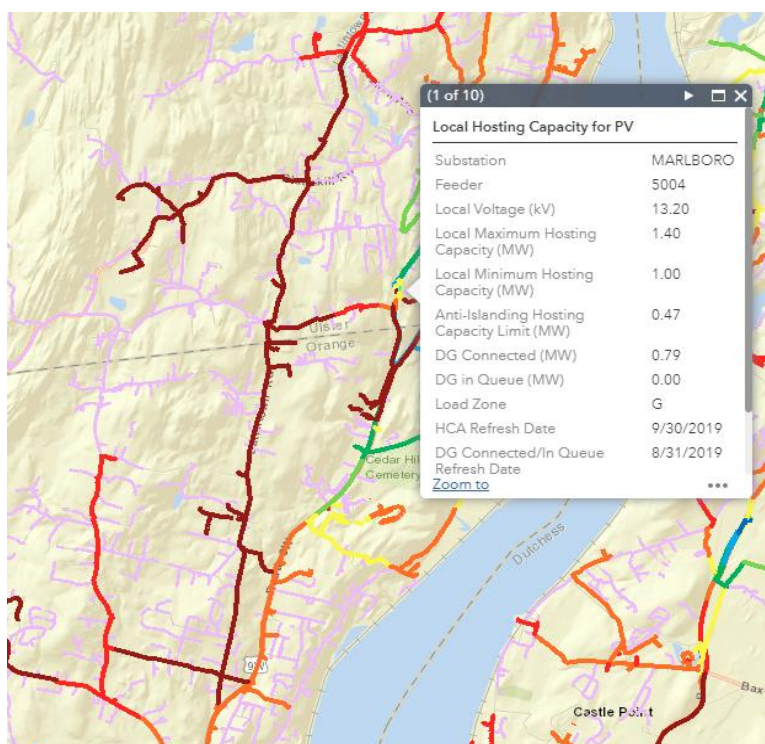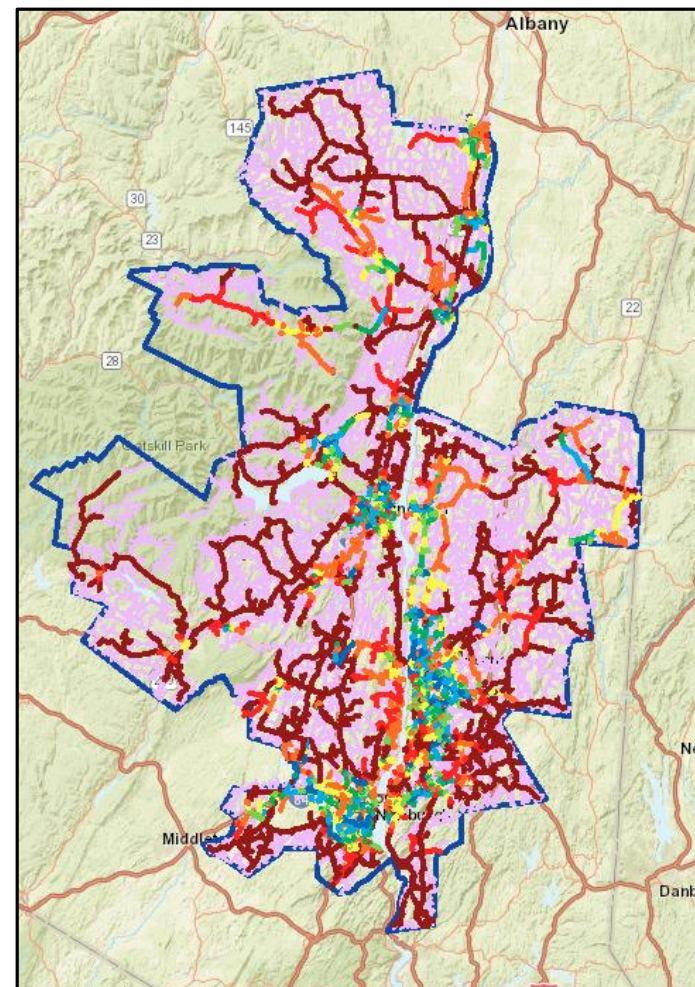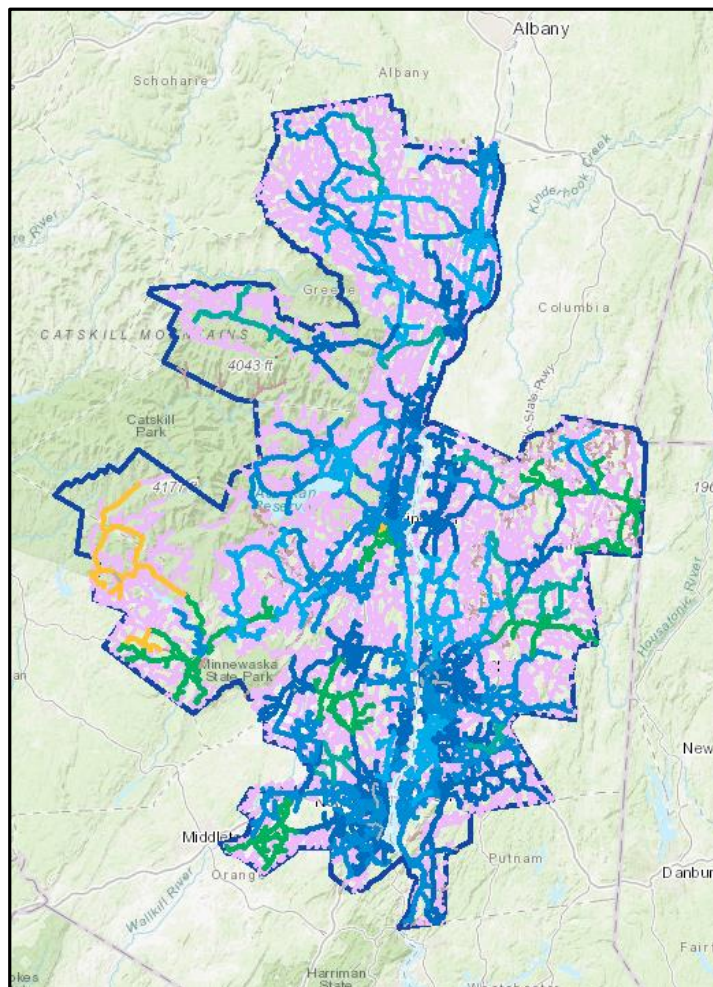


**Local Hosting Capacity for PV**

| | |
|---|---|
| Substation | MARLBORO |
| Feeder | 5004 |
| Local Voltage (kV) | 13.20 |
| Local Maximum Hosting Capacity (MW) | 1.40 |
| Local Minimum Hosting Capacity (MW) | 1.00 |
| Anti-Islanding Hosting Capacity Limit (MW) | 0.47 |
| DG Connected (MW) | 0.79 |
| DG in Queue (MW) | 0.00 |
| Load Zone | G |
| HCA Refresh Date | 9/30/2019 |
| DG Connected/In Queue Refresh Date | 8/31/2019 |

**Legend**

**HC Feeder Segments**

Feeder Level Data

- > 5.0 MW
- 3.0 -4.99 MW
- 2.0 - 2.99 MW
- 1.50 - 1.99 MW
- 1.0 - 1.49 MW
- .50 - 0.99 MW
- 0.30 - 0.49 MW
- 0.0 - .29 MW
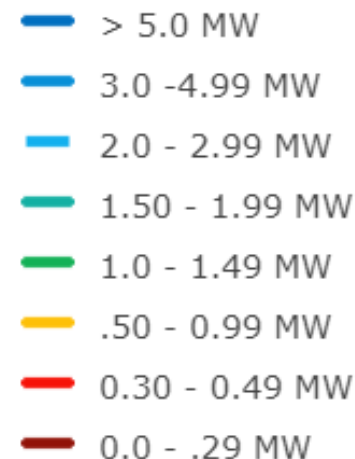
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# Central Hudson Map – Stage 2.1 vs. Stage 3.0

# Hosting Capacity Maps – Stage 2 VS. Stage 3
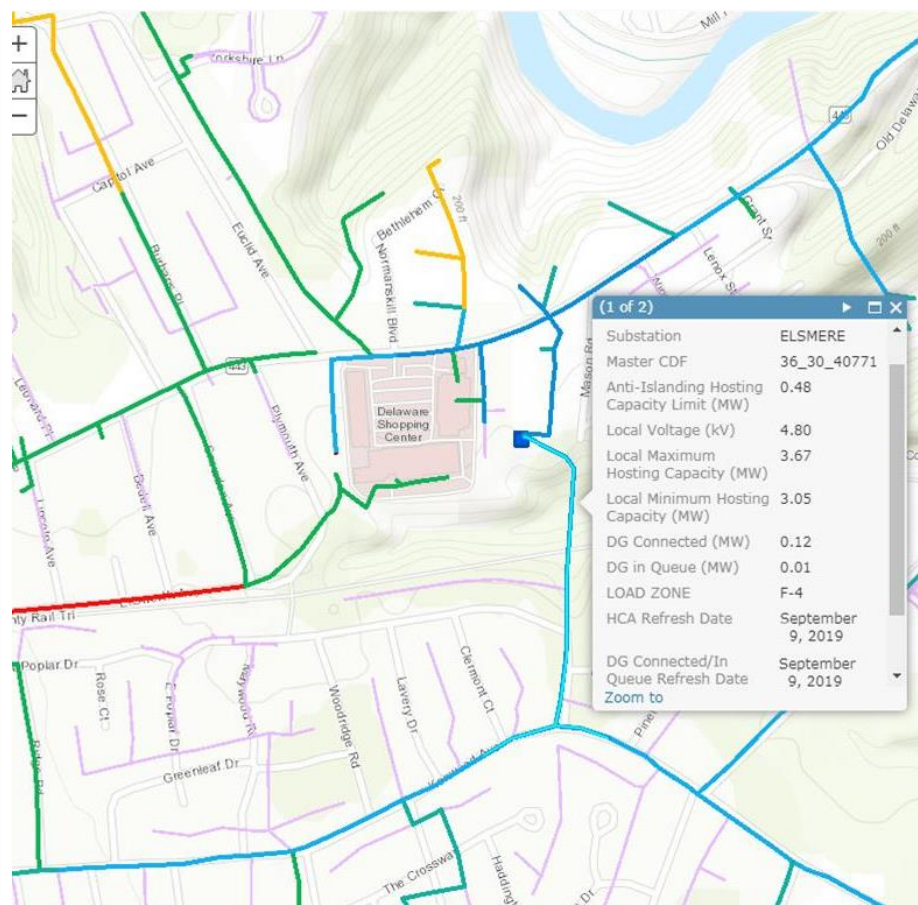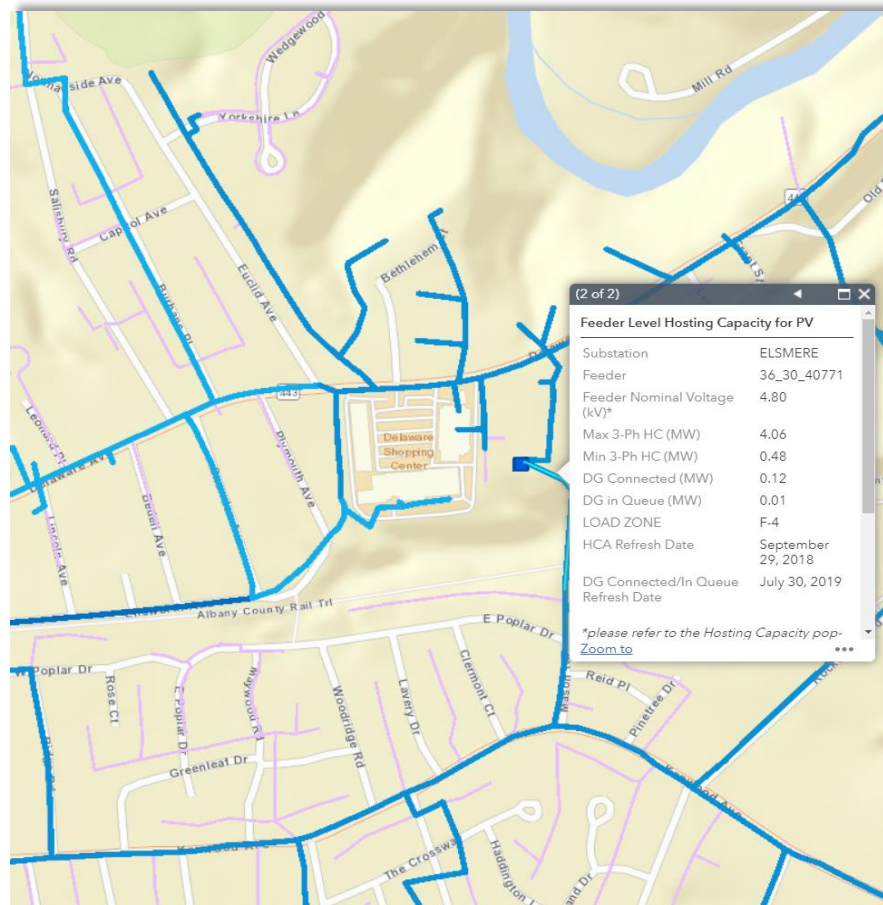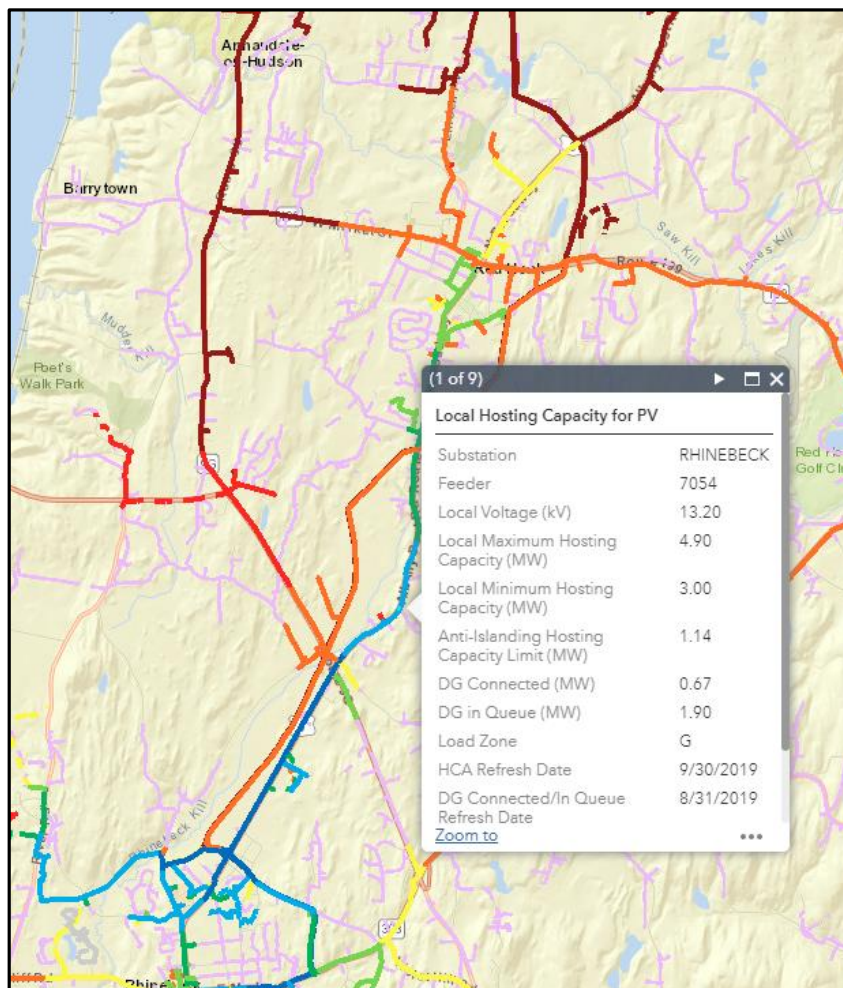
# Central Hudson Map – Hibernia 7012
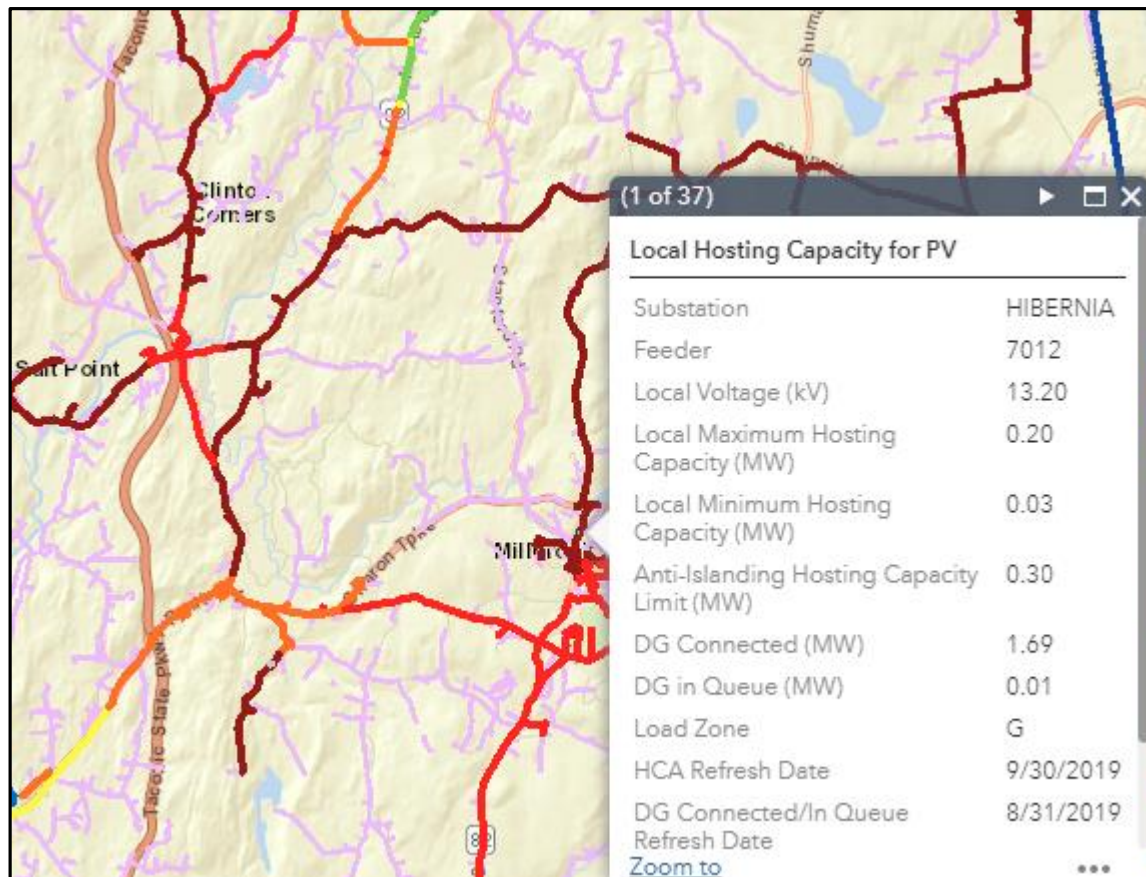


**Legend**

**HC Feeder Segments**

Feeder Level Data

- > 5.0 MW
- 3.0 -4.99 MW
- 2.0 - 2.99 MW
- 1.50 - 1.99 MW
- 1.0 - 1.49 MW
- .50 - 0.99 MW
- 0.30 - 0.49 MW
- 0.0 - .29 MW
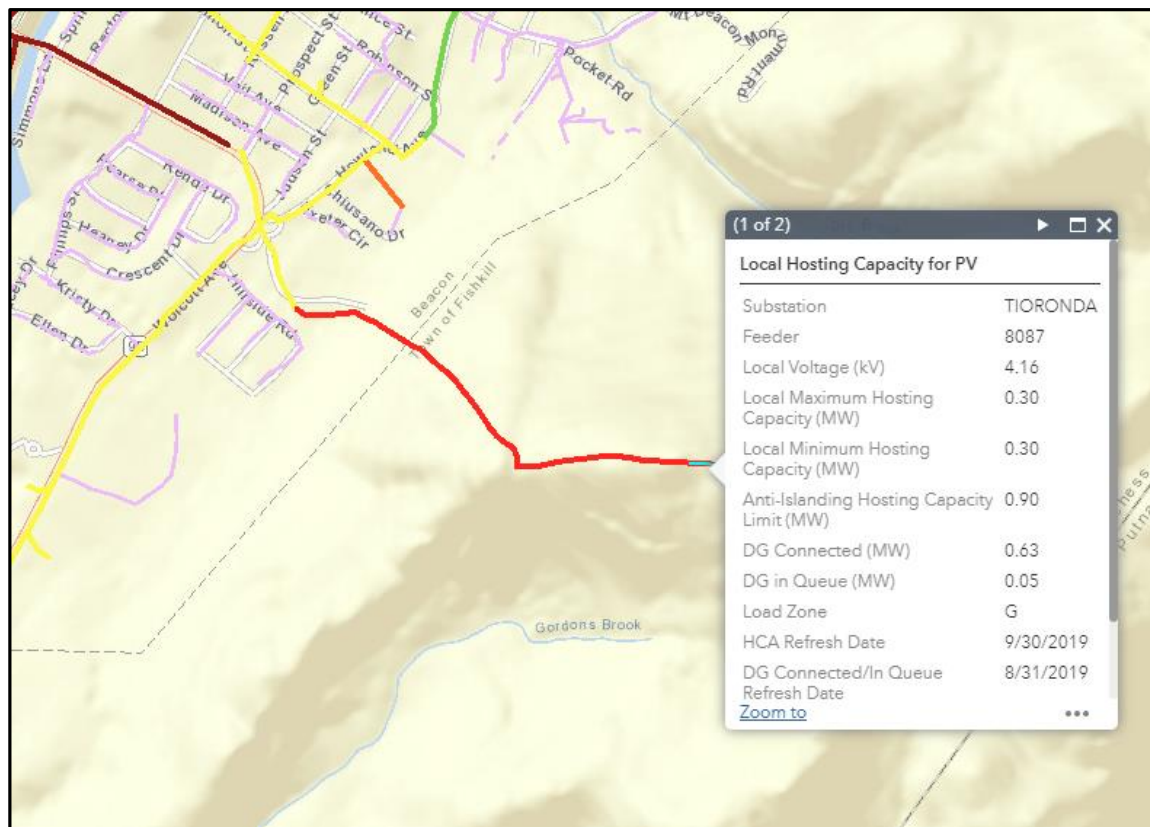
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# Central Hudson Map – Rhinebeck 7054



**Legend**

**HC Feeder Segments**

Feeder Level Data

- — > 5.0 MW
- — 3.0 -4.99 MW
- — 2.0 - 2.99 MW
- — 1.50 - 1.99 MW
- — 1.0 - 1.49 MW
- — .50 - 0.99 MW
- — 0.30 - 0.49 MW
- — 0.0 - .29 MW

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# Central Hudson Map – Tioronda 8087



**Legend**

**HC Feeder Segments**

Feeder Level Data
- > 5.0 MW
- 3.0 -4.99 MW
- 2.0 - 2.99 MW
- 1.50 - 1.99 MW
- 1.0 - 1.49 MW
- .50 - 0.99 MW
- 0.30 - 0.49 MW
- 0.0 - .29 MW

(1 of 2)

**Local Hosting Capacity for PV**

| | |
|---|---|
| Substation | TIORONDA |
| Feeder | 8087 |
| Local Voltage (kV) | 4.16 |
| Local Maximum Hosting Capacity (MW) | 0.30 |
| Local Minimum Hosting Capacity (MW) | 0.30 |
| Anti-Islanding Hosting Capacity Limit (MW) | 0.90 |
| DG Connected (MW) | 0.63 |
| DG in Queue (MW) | 0.05 |
| Load Zone | G |
| HCA Refresh Date | 9/30/2019 |
| DG Connected/In Queue Refresh Date | 8/31/2019 |

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# Live Demo – National Grid

Resources:
hhttps://www.nationalgridus.com/Business-Partners/NY-System-Portal

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# Live Demo – Con Edison Network Hosting Capacity

Resources:
[https://www.coned.com/en/business-partners/hosting-capacity](https://www.coned.com/en/business-partners/hosting-capacity)

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# Future Stakeholder Engagement & Next Steps

- Stage 3.0 was a significant improvement where the JU are now presenting a much more granular sub-feeder level information based on stakeholder feedback provided in April 2018.

- While our data and formats being released on October 1$^{st}$ are fixed, we plan to hold multiple stakeholder sessions to get additional stakeholder input on next steps and future enhancements.  Some of those steps might require minor format changes and some might require major advancements to the existing functionality.  The JU are proposing a session in October and November to support that.

- Stage 3.X enhancements previously discussed as major priorities:
  - HCA for other DER types (storage, CHP, EVs)
  - Forecasted hosting capacity
  - Increased analysis refresh rate
  - Upstream substation/bank level constraints
  - Abnormal circuit configurations

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# Thank you!

www.jointutilitiesofny.org

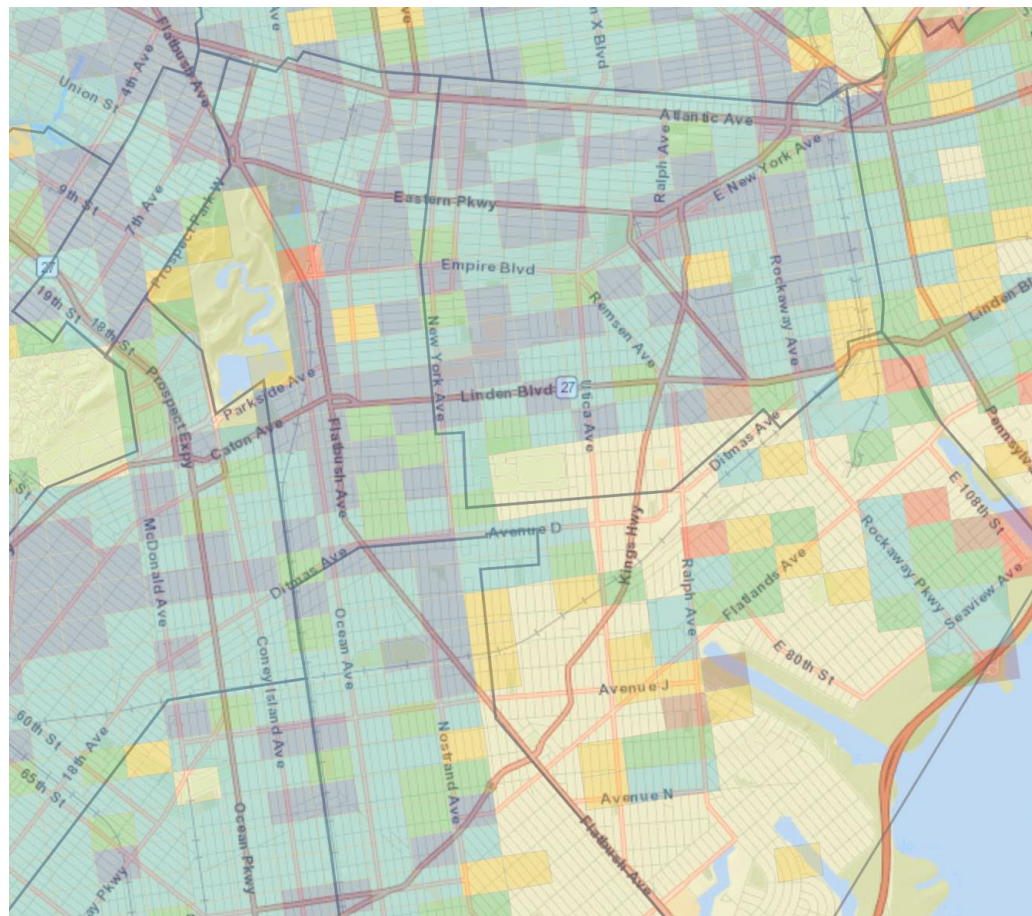http://jointutilitiesofny.org/utility-specific-pages/hosting-capacity/

# Appendix – Con Edison Network Hosting Capacity Screenshots

# M&S Plate View

Shading within Network Areas is representative of the approximate Hosting Capacity values that can be found in the geographical region based on the observed minimum loads at distribution transformers.

# Mapping Symbols
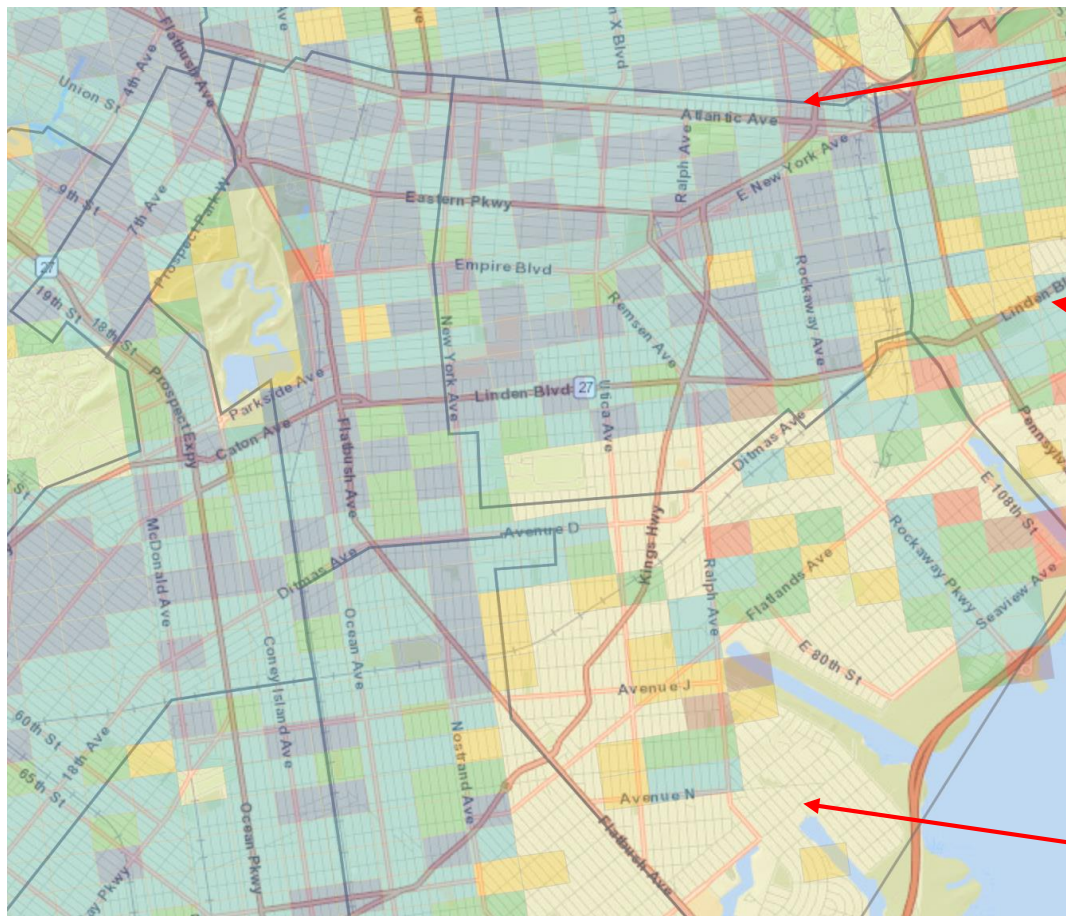


Grey outlines are Network Boundaries

Rectangular outlines are M&S Plates

No shading indicates overhead areas

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# Structure Level Hosting Capacity
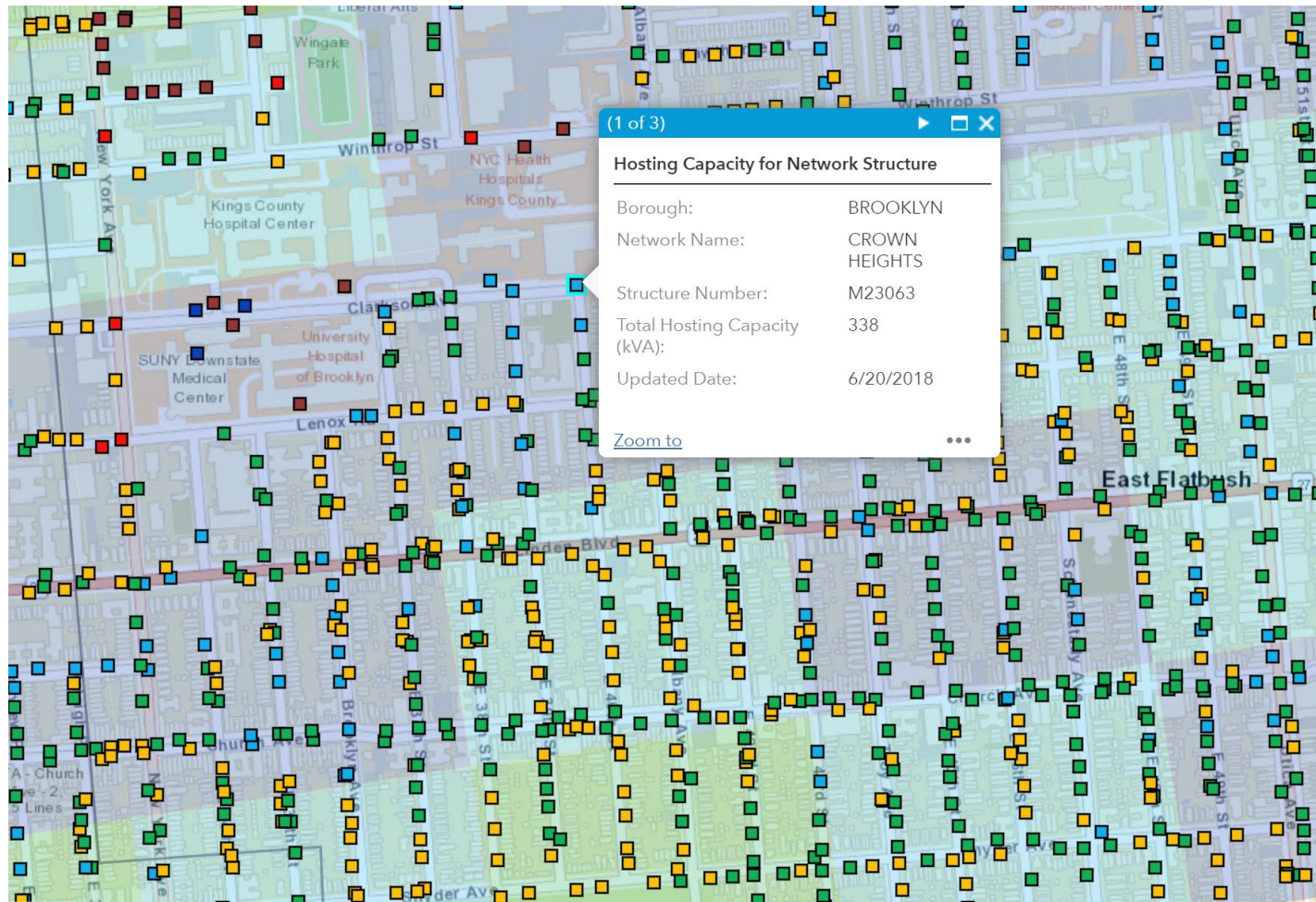


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# System Data Available
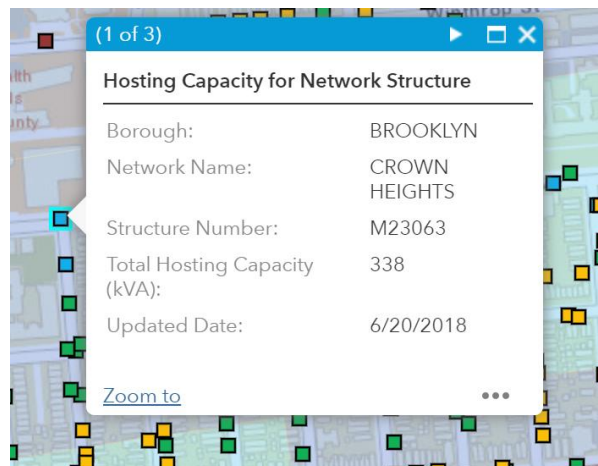


Structure Information & Hosting Capacity



Network Level Information and Data

Network & Structure Identifying Characteristics

# Non-Wires Solutions
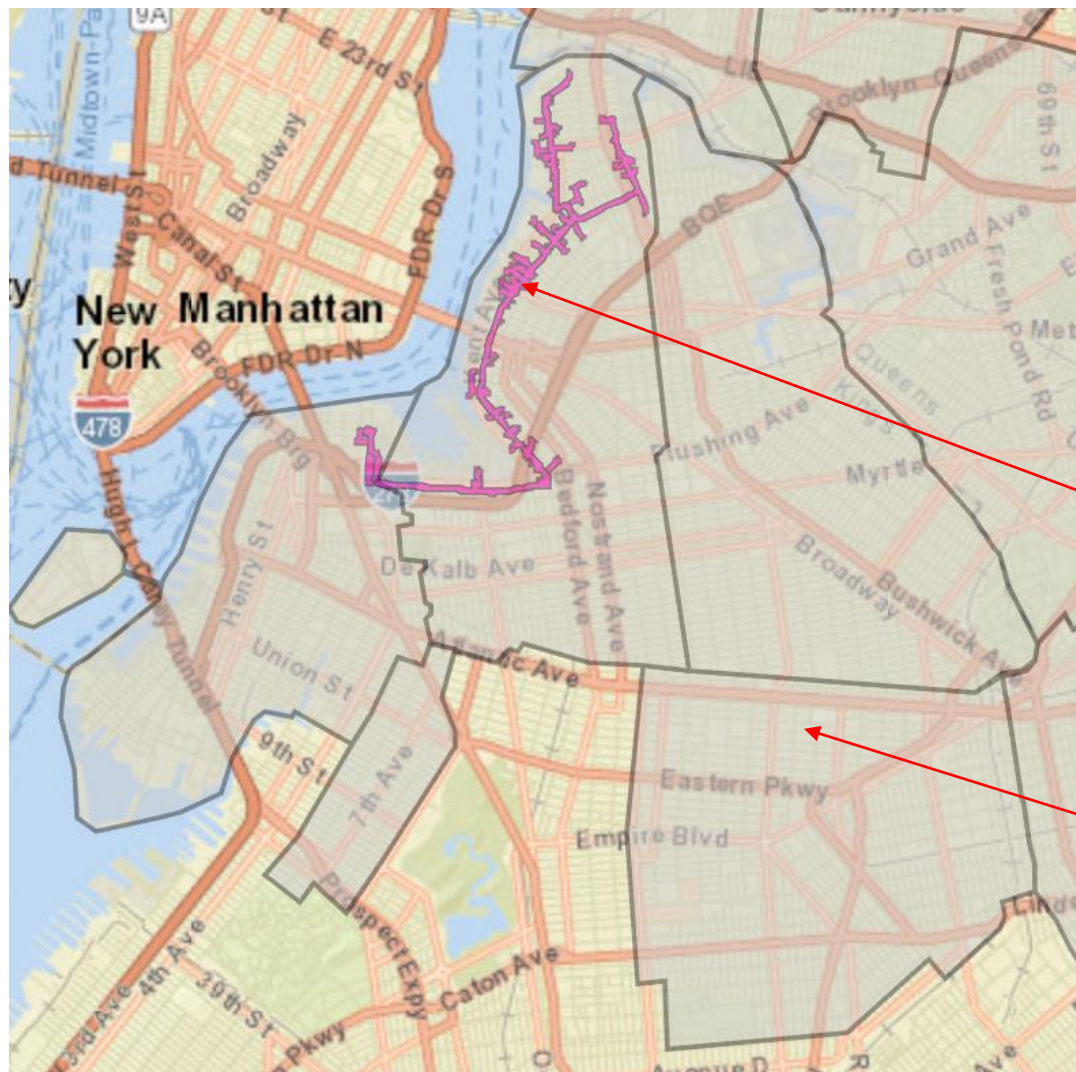


Feeder Level

Network Level

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# Requested Enhancements Under Consideration

- HCA for other DER types (storage, CHP, EVs, hybrid solar + storage)

- Forecasted hosting capacity

- Increased analysis refresh rate

- Upstream substation/bank level constraints

- Abnormal circuit configurations

- Additional data pop-up items:
    - HCA violation criteria type
    - Circuit equipment ratings

- Additional map functionality
    - Downloadability
    - Filterability

- Better communication of available reference materials and supporting documentation

# Stakeholder Inputs and Engagement Group Decision

| Stakeholder Input | Discussion Points | Next Steps |
|---|---|---|
| On the topic of HCA for other DER types (storage, CHP, EVs), stakeholders noted | • Stakeholders noted it would be useful not only to know where storage hosting capacity exists, but also where hosting capacity could benefit as a result of storage.<br><br>• Stakeholders requested solar plus storage hybrid systems be included in the list of DER types.<br><br>• In other jurisdictions, hosting capacity values have been provided as a technology agnostic generation and load based hosting capacity value.<br><br>• When calculating hosting capacity for load based DER or storage, stakeholders requested to move towards more granular analysis rather than static snapshots. Not necessarily 8760 hours of data, but at least more seasonally relevant data from a load and generation perspective.<br><br>• California has 576 hourly profiles for hosting capacity. Either under the stakeholder proposal or utility proposal, customer can propose using a solar plus storage system (or profile) for different seasons. This would require the utilities to move away from a simple max nameplate capacity. | **OPEN** – Both IREC and Opus One Solutions will follow up with materials on how California and Hawaii have incorporated hourly values into their hosting capacity analysis. This will be an item for further discussion at upcoming meetings. |

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# Stakeholder Inputs and Engagement Group Decision

| Stakeholder Input | Discussion Points | Next Steps |
|---|---|---|
| On forecasted hosting capacity | • Forecasted hosting capacity was raised a possible future enhancement but there wasn't a large push to make that a priority compared to other items. | **OPEN** – Further discussion warranted. This will be an item for further discussion at upcoming meetings. |
| On increased refresh rates | • Stakeholders noted they'd ideally like to see a daily refresh of the analysis but noted that a daily refresh of the queued/installed DG data, and a monthly refresh of any circuits where new DER have been interconnected would still be a major enhancement. | **OPEN** – Further discussion warranted. This will be an item for further discussion at upcoming meetings. |
| On upstream constraints and substation level hosting capacity | • Upstream substation/bank level constraints remain a high priority for stakeholders and was discussed as three possible types of enhancements:<br>  • Further clarification on 3V0 / backfeed protection status<br>  • Identified transmission constraint<br>  • Calculated substation/bank level hosting capacity<br>  • Better identification of transformer bank/substation names in the data pop-ups | **OPEN** – Further discussion warranted. This will be an item for further discussion at upcoming meetings. |

# Stakeholder Inputs and Engagement Group Decision

| Stakeholder Input | Discussion Points | Next Steps |
|---|---|---|
| On abnormal circuit configurations | • Abnormal circuit configurations were noted as less of an immediate priority in the context of N-1 or alternate circuit conditions, as that gets closer to a utility distribution management tool. However, if there are conditions unique to a particular circuit that could be considered *abnormal*, stakeholders requested it would be good to add a notes or comment box to explain that. | **OPEN** – Further discussion warranted. This will be an item for further discussion at upcoming meetings. |
| On additional data pop-up items | • Stakeholders requested the criteria violations type, i.e. thermal, voltage, protection be included in future enhancements of the displays.<br>• Stakeholders requested information on thermal equipment ratings or characteristics be provided in the pop-ups to get a better sense of the potential reconductoring upgrade costs. | **OPEN** – Further discussion warranted. This will be an item for further discussion at upcoming meetings. |

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# Stakeholder Inputs and Engagement Group Decision

| Stakeholder Input | Discussion Points | Next Steps |
|---|---|---|
| On promoting supporting reference material | • Stakeholders noted there is still an issue of how the utilities can better promote the displays and the level of information the JU are providing.<br>    ○ An autogenerated email with links to useful reference material upon signing up is one way to go about this.<br>    ○ Providing a user guide similar to what is provided in Nevada was raised as a suggestion. | **OPEN** – Stakeholders agreed to reviewing the current reference material and online recordings to determine if similar JU standardized material should be provided for Stage 3.0 and what additional improvements can be made. This will be an item for further discussion at upcoming meetings. |

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# Stakeholder Inputs and Engagement Group Decision

| Stakeholder Input | Discussion Points | Next Steps |
|---|---|---|
| On map functionality to allow downloadability and filterability | • Stakeholders noted it could be valuable to be able to access downloadable versions of the hosting capacity map data or overlay files to add on top of other third-party displays.<br>• Map filterability was raised as item for future enhancement in the display functionality e.g. only display feeders with a hosting capacity > 1 MW | **OPEN** – The advanced functionality of each utility's portals are based on the individual utility mapping systems. Filterability as requested by stakeholders currently exists for utilities with attribute tables. Additional functionality advancements requires further discussion. |

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